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(71) Applicant
Photo-Me International plc
 (Incorporated in the United Kingdom)

**Church Road, Bookham, Surrey, KT23 3EU,
 United Kingdom**

(72) Inventors
David William Miller
Roy Kemp
Anthony Joseph Charles-James Wiejski

(74) Agent and/or Address for Service
Marks & Clerk
**57-60 Lincoln's Inn Fields, London, WC2A 3LS,
 United Kingdom**

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(54) Producing a picture of a subject against a selected background

(57) Apparatus for printing a picture of a person against a chosen background comprises a colour video camera 12, a colour television screen or monitor 14 for displaying the person as imaged by the camera, a computer processor 16, a thermal transfer printer 18, a coin acceptor 20 and customer controls 22. A hard disk in the processor 16 stores background scenes and also data defining an area in each background scene for the person's picture to appear. A frame store or grabber 24 in the processor 16 grabs a frame from the video camera either at the end of a timed period or upon instruction by the person. Frame grabbing may be repeated once if the person rejects the first frame as it appears on the monitor. The processor 16 thereafter provides a still formed by placing a portion of the grabbed frame into the predetermined area of the background scene, and the picture is printed.

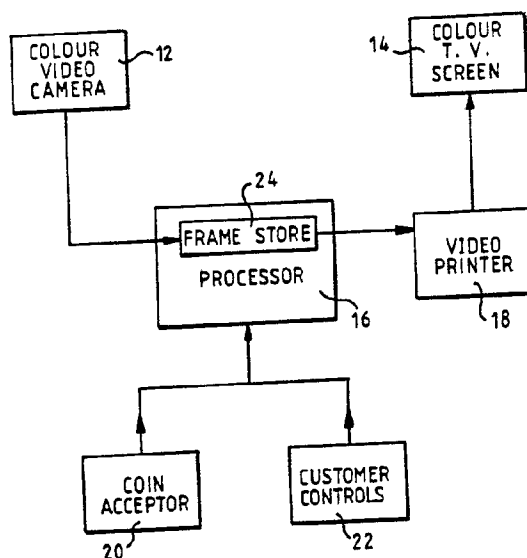


FIG.1

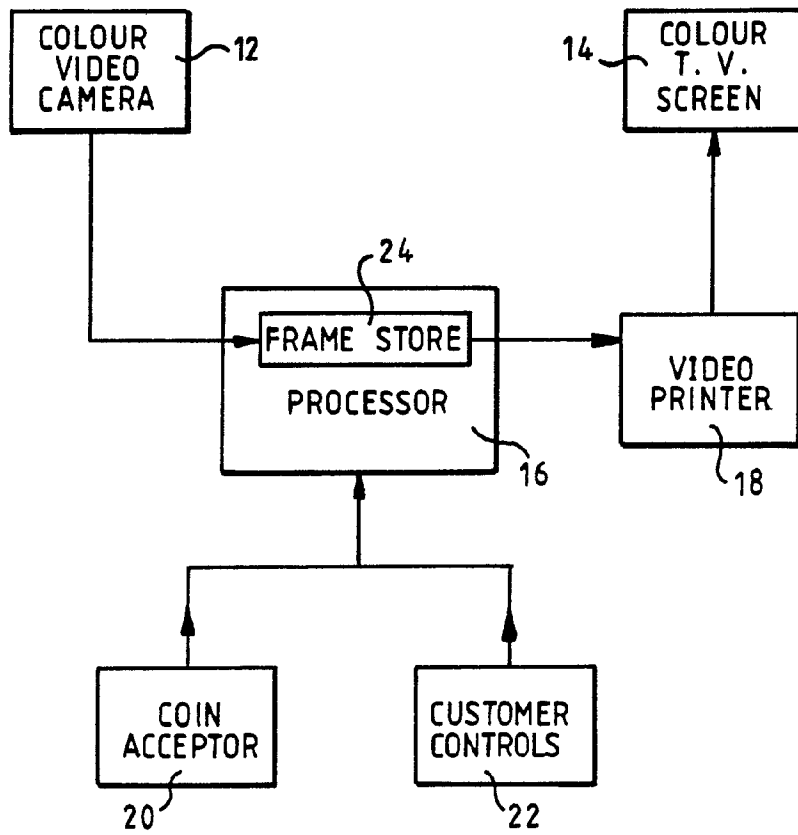


FIG.1



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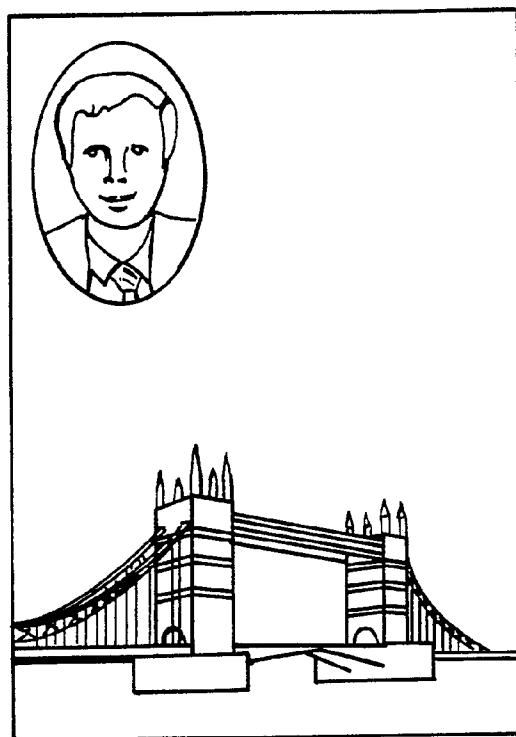


FIG.3

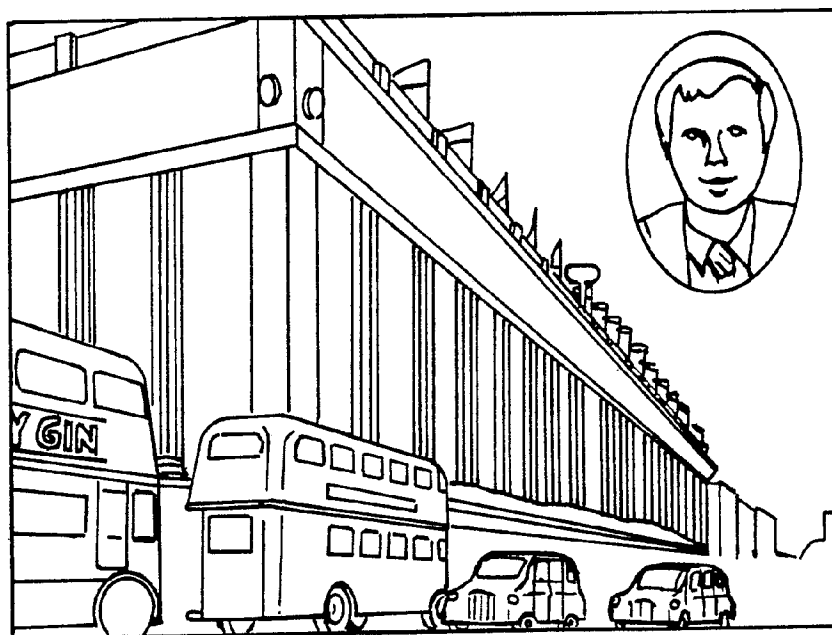
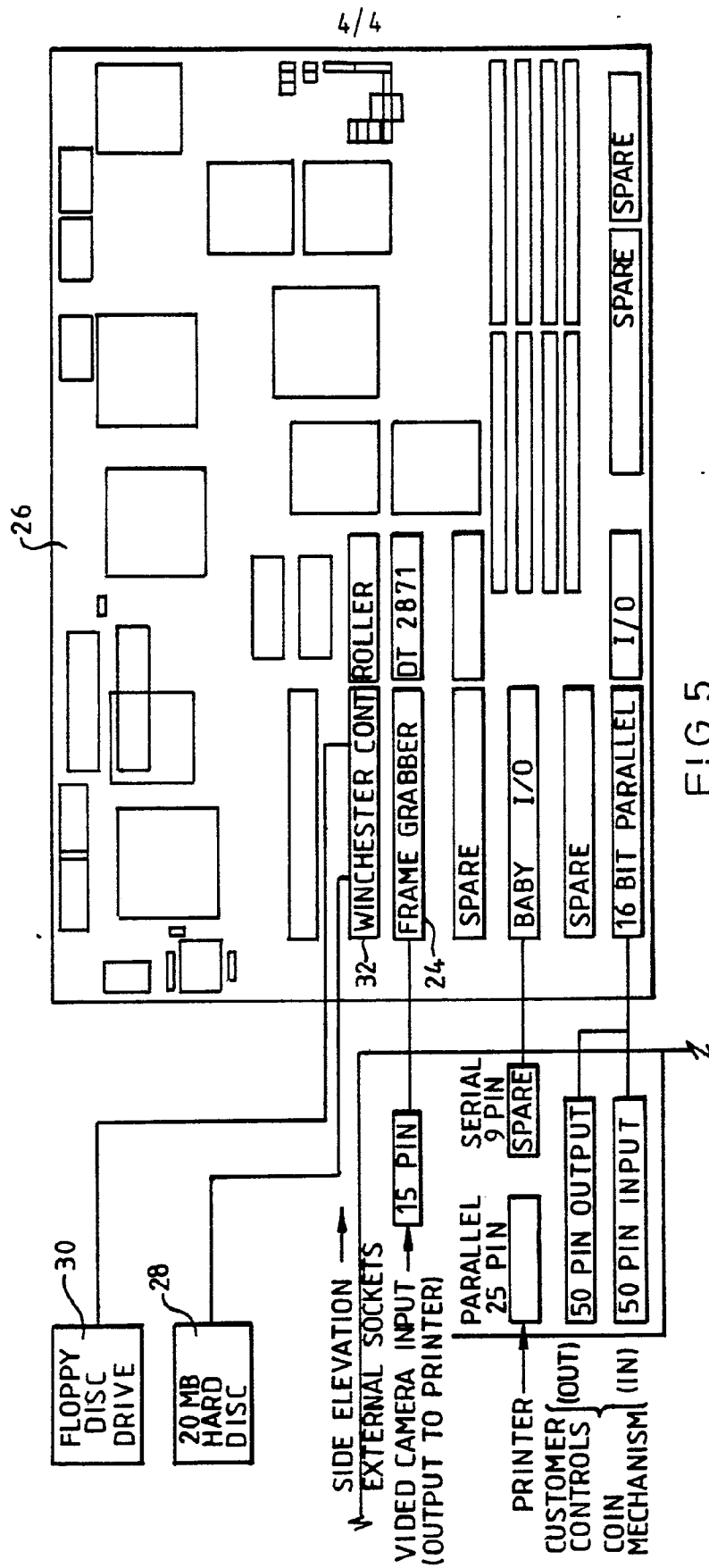


FIG.4



Method and apparatus for producing a picture of a
subject against a background

This invention relates to a method and apparatus for producing a picture of a subject against a background.

The method of the invention comprises the steps of: -

storing and displaying a plurality of images of respectively different backgrounds;

selecting one of said images for the picture;

posing the subject in front of a video camera;

operating the camera and obtaining a still from the camera for the picture;

combining the still with the selected image to obtain the picture; and

printing the picture.

The apparatus of the invention comprises: -

means for storing and displaying a plurality of images of respectively different backgrounds;

means for selecting one of said images for the picture;

a video camera adapted and arranged so that the subject can be posed in front of the camera;

means for operating the camera and obtaining a still from the camera for the picture;

means for combining the still with the selected image to obtain the picture; and

means for printing the picture.

According to one aspect of the invention, the method is characterized in that a signal is given for the subject to be posed and in that the still is obtained by selecting the particular pose of the subject either at the end of a timed period or upon operation of manually operable means.

According to this aspect of the invention, the apparatus is characterized by means for giving a signal for the subject to be posed and obtaining the still by selecting the particular pose of the subject either at the end of a timed period or upon operation of manually operable means.

According to another aspect of the invention, the method is characterized in that the still is placed in a predetermined area of the background, said area being in a different position in the picture depending upon the particular background selected.

The invention will be described by way of example with reference to the drawings, wherein: -

Figure 1 shows the interconnections of the colour video camera, the processor, the colour TV screen or monitor, the video printer, the coin acceptor and the customer controls;

Figure 2 represents an operational sequence of the apparatus which is operative after insertion of the required money;

Figures 3 and 4 show two different printed pictures; and

Figure 5 is a composite view of a motherboard in plan view and sockets in side elevation.

The illustrated apparatus 10 comprises a colour video camera 12, a colour television screen (or monitor) 14, a computer processor 16, a thermal transfer printer 18, a coin acceptor 20 and customer controls 22.

The processor 16 actually comprises several peripheral devices, namely: - a frame store or frame grabber 24, which is a, very expensive, printed circuit board ("PCB") in the processor 16; a type "386" Mother board (PCB) 26; a ruggedised hard disk 28 for storage of backgrounds, with a capacity of 20Mb; a standard floppy disk drive 30 for loading data to the hard disk 28 (whereby background scenery can be added and changed quickly); and a Winchester Controller board 32 which enables the Mother board 26 to intercommunicate with the other boards (PCB's). The frame store or frame grabber board 24 is a type DT 2871, manufactured by Data Translation Inc. of the United States of America.

The apparatus also comprises a booth, not shown, which may be of the well-known type for use in obtaining portrait photographs from automatic photographic equipment or may alternatively be an "open-plan" booth, for a person wishing to use the apparatus. The booth is provided with seating for the person, the video camera 12 and TV screen or monitor 14 being placed in front of where the person sits. The video camera 12 is arranged in known manner to produce a moving picture of the person which is reproduced on the TV screen or monitor 14 for the person to look at. The coin acceptor 20 may be placed within close reach of where the person sits, so that the person can insert money when already

seated. Alternatively, the coin acceptor 20 may be placed substantially out of reach of the seating.

The hard disk 28 stores (digitally) a plurality of frames (for example, four) of different background scenes and, for each individual scene, also stores data defining a predetermined area of the background wherein the still showing the person is to appear. Prior to storage in the hard disk 28, each scene will have been analysed and the area will have been chosen to occupy a relatively uninteresting part of the background scene. By way of example, Figure 3 shows the area in the top left-hand corner, in the sky above London's Tower Bridge, whilst Figure 4 shows the area in the top right-hand corner, in the sky above another typical London scene. The several background scenes are loaded into the hard disk 28 by means of a floppy disk (not shown) inserted into the floppy disk drive 30.

The apparatus also comprises an electronic timer (not shown) for timing a short period, for example, five to ten seconds, at the end of which the frame store or frame grabber 24 stores or "grabs" whatever frame is being transmitted at that moment from the video camera 12 and shown on the screen 14, this stored or grabbed frame being the frame from which a portion is extracted, big enough to show the person being photographed, as a still for inclusion in the printed picture.

Finally, the apparatus comprises means to enable the person (once only) to reject the stored or grabbed frame and to cause the apparatus to repeat the procedure of grabbing another frame from the output of the video camera 12.

The apparatus then electronically combines the selected background scene with the still showing the person, and prints a picture from the combination. The printer is a thermal transfer printer made by the Japanese Company Hitachi.

The Hitachi thermal transfer printer functions with two items of consumable goods: film and paper.

The film is wound onto a twin-reeled plastic cassette which is loaded into the front of the printer. Batches of these cassettes may be manufactured with a special marking. A sensor in the printer is adapted to locate this mark and permit this cassette to be loaded. Any unmarked film cassettes inserted will not be accepted by the printer.

Each sheet of paper inserted will be marked with a bar code on the reverse side. The printer will recognise this code as being the only one permitted and so allow operation to continue.

Apart from the coin acceptor, the customer controls are confined to four large buttons in rows and columns of two buttons each, the buttons serving different functions at different phases of operation.

The operational sequence is as follows: -

<u>MODE</u>	<u>SCREEN MESSAGE</u>	<u>FUNCTIONAL SEQUENCE</u>
WAIT	' WELCOME TO THE PMI EXPRESS 2000'	OPERATIONAL SOFTWARE IN THE HARD DISK CONTROLS MESSAGE VIA THE FRAME GRABBER TO THE SCREEN WITH A FOUR SECOND TIME DELAY.
START	' THANKYOU' ' PLEASE SIT DOWN' ...	COIN MECHANISM REGISTERS £2 AND SIGNALS VIA PARALLEL INTERFACE ("P.I.") TO DISPLAY FOUR BACKGROUNDS.

SELECT ' NOW SELECT YOUR
BACKGROUND BACKGROUND

ARROWS ON SCREEN
POINT TO PUSH
BUTTONS FOR CHOICE.
WHEN ONE IS PRESSED,
THE CHOSEN
BACKGROUND IS
STORED AND
A SIGNAL IS SENT VIA
THE P.I. TO SWITCH
ON THE CAMERA 12.

POSE ' YOUR PICTURE WILL
 BE TAKEN IN 5
 SECONDS'

SOFTWARE TIMER
ACTIVATES THE
PRINTER TO FREEZE
THE IMAGE RECEIVED
VIA THE FRAME
GRABBER.

' DO YOU LIKE THIS
POSE? YES.....
.....NO'

IF NO IS CHOSEN A
SIGNAL VIA THE P.I.
RETURNS THE SCREEN
TO THE START OF THE
POSE MODE, ONCE
ONLY. IF YES IS
CHOSEN THEN THEN
SIGNAL VIA THE P.I.
COMMANDS THE PRINTER
TO PRINT THE IMAGE
RECEIVED ONTO THE
BACKGROUND STORED.

PRINT	' YOUR PICTURE IS BEING PRINTED'	AFTER THE PRINT CYCLE IS COMPLETE
	' READY IN JUST A MINUTE'	(90 SECONDS) A REQUEST IS MADE TO THE USER FOR A REPRINT.
	' WOULD YOU LIKE ANOTHER?	
	YES NO'	

REPRINT	' PLEASE INSERT £2'	IF "YES" IS CHOSEN, THE SIGNAL SENT VIA THE P.I. REQUESTS MORE MONEY (£2) FROM THE USER. WHEN INSERTED THE COIN MECHANISM REGISTERS £2 AND THE PRINTER IS INSTRUCTED TO REPRINT THE PREVIOUS PICTURE.
	' THANK YOU FOR YOUR CUSTOM.....	IF "NO" IS CHOSEN, THE SYSTEM IS RETURNED TO WAIT MODE.

In a modification, not shown, an easily operated manual control is provided for the person to signal the frame grabber 24 to grab a particular frame being shown at that time.

Claims: -

1. A method of producing a picture of a subject against a background, comprising the steps of: -

storing and displaying a plurality of images of respectively different backgrounds;

selecting one of said images for the picture;

posing the subject in front of a video camera;

operating the camera and obtaining a still from the camera for the picture;

combining the still with the selected image to obtain the picture; and

printing the picture;

characterised in that a signal is given for the subject to be posed and in that the still is obtained by selecting the particular pose of the subject either at the end of a timed period or upon operation of manually operable means.

2. A method as claimed in claim 1, wherein a still can be selected or rejected.

3. A method as claimed in claim 2, wherein a previous still has been rejected after being obtained in like manner.

4. A method as claimed in claim 1, 2 or 3, characterised in that the still is placed in a predetermined area of the background, said area being in a different position in the picture depending upon the particular background selected.

5. A method of producing a picture of a subject against a background, comprising the steps of: -

storing and displaying a plurality of images of respectively different backgrounds;

selecting one of said images for the picture;

posing the subject in front of a video camera;

operating the camera and obtaining a still from the camera for the picture;

combining the still with the selected image to obtain the picture; and

printing the picture;

characterised in that the still is placed in a predetermined area of the background, said area being in a different position in the picture depending upon the particular background selected.

6. A method as claimed in claim 5, wherein a still can be selected or rejected.

7. A method as claimed in claim 6, wherein a previous still has been rejected after being obtained in like manner.

8. Apparatus for producing a picture of a subject against a background, comprising: -

means for storing and displaying a plurality of images of respectively different backgrounds;

means for selecting one of said images for the picture;

a video camera adapted and arranged so that the subject can be posed in front of the camera;

means for operating the camera and obtaining a still from the camera for the picture;

means for combining the still with the selected image to obtain the picture; and

means for printing the picture;

characterised by means for giving a signal for the subject to be posed and obtaining the still by selecting the particular pose of the subject either at the end of a timed period or upon operation of manually operable means.

9. Apparatus as claimed in claim 8, wherein means is provided for selecting or rejecting a still.

10. Apparatus as claimed in claim 9, wherein means is provided for carrying out the step, after rejection of a still, of giving a further signal for the subject to be posed and obtaining a further still by selecting the particular pose of the subject either at the end of a further timed period or upon further operation of said manually operable means.